

WHAT IS CLAIMED IS:

1. An apparatus for moving frameworks such as window frames or sashes, from a welding machine to a work station for further processing of the frameworks, said apparatus comprising:

a track adapted for mounting at an elevated position so as to extend substantially horizontally from said welding machine to said work station;

an arm assembly mounted for movement along said track and having gripping devices arranged one above the other, each gripping device adapted to releasably engage and grip one of said frameworks; and

an actuator arrangement for moving said arm assembly along said track between a first position where said arm assembly can engage the frameworks when they are arranged one above the other in said welding machine and then move the frameworks to a second position where said gripping devices engage and grip the frameworks at said work station during use of the apparatus.

2. An apparatus according to claim 1 wherein said arm assembly includes a lead arm spaced horizontally away from said gripping devices and said apparatus includes a vertical linear actuator for moving said lead arm selectively in a vertical direction, whereby during use of said apparatus, said vertical linear actuator is able to lower said lead arm into openings formed by the frameworks and said actuator arrangement is able to move said lead arm horizontally to remove said frameworks from said welding machine.

3. An apparatus according to claim 2 including first and second pairs of horizontally extending guide rails adapted to extend during use of said apparatus from said work station towards said welding machine, said first pair being located above said second pair, wherein horizontal movement of said lead arm by said actuator arrangement is able to move two of said frameworks respectively from said welding machine to and along said first and second pairs of guide rails during use of the apparatus.

4. An apparatus according to claim 3 including an adjustable mounting arrangement for both pairs of guide rails whereby a horizontal distance between the guide rails of each pair can be changed and can be selected to correspond to a length or width of each welded framework.
5. An apparatus according to claim 2 wherein said vertical linear actuator comprises at least one pneumatic linear actuator having a pneumatic cylinder and a vertical actuator rod movable in said cylinder and connected to said lead arm in order to move said lead arm in the vertical direction.
6. An apparatus according to claim 2 wherein said actuator arrangement includes an elongate toothed rack extending along said track and connected thereto, a rotatable gear operatively engaging said rack, and a drive motor for rotating said gear in order to cause said arm assembly to move horizontally along said track.
7. An apparatus according to claim 2 wherein said arm assembly also includes a vertically extending gripper arm, there are two of said gripping devices mounted on a lower section of said gripper arm one above the other, and said lead arm is connected to said gripper arm by a horizontally extending arm section.
8. An apparatus for moving frameworks, such as window frames or sashes, from a welding machine to a work station for further processing of the frameworks, said apparatus comprising:
  - two parallel tracks adapted for mounting at an elevated position so as to extend substantially horizontally from said welding machine to said work station;
  - two arm assemblies each mounted for movement along a respective one of said tracks and each having two gripping devices arranged one above the other, one gripping device of one arm assembly being paired with and horizontally aligned with a respective one of the gripping devices of the other

arm assembly, each pair of gripping devices being adapted to engage and grip one of said frameworks; and

two actuator arrangements for moving respectively said arm assemblies along said tracks between a first position where said arm assemblies can engage the two frameworks when they are arranged one above the other in said welding machine and then move the two frameworks to a second position where said gripping devices engage and grip the frameworks at said work station during use of the apparatus.

9. An apparatus according to claim 8 wherein each arm assembly includes a lead arm spaced horizontally away from the gripping devices of the same arm assembly and said apparatus includes two vertical linear actuators each capable of moving a respective arm assembly selectively in a vertical direction during use of said apparatus, each vertical linear actuator being able to lower its respective lead arm into two aligned openings formed by said two frameworks and then the actuator arrangements are able to move the lead arms horizontally to remove said frameworks from said welding machine.

10. An apparatus according to claim 9 including first and second pairs of horizontally extending guide rails adapted to extend from said work station towards said welding machine, said first pair being located above and spaced apart from said second pair, wherein horizontal movement of the two lead arms by said actuator arrangements is able to move said two frameworks along said first and second pairs of guide rails and to said work station during use of the apparatus.

11. An apparatus according to claim 10 including an adjustable mounting arrangement for both pairs of guide rails whereby a horizontal distance between the guide rails of each pair can be changed and can be selected to correspond to a length or width of each welded framework.

12. An apparatus according to claim 10 wherein each of said vertical linear actuators includes a pneumatic linear actuator having a pneumatic cylinder

and a vertical actuator rod movable in said cylinder and connected to its respective arm assembly in order to move this arm assembly in the vertical direction.

13. An apparatus according to claim 10 wherein each of said actuator arrangements includes an elongate toothed rack extending along a respective one of said two tracks and connected thereto, a rotatable gear operatively engaging said rack, and a drive motor for rotating said gear in order to cause its respective arm assembly to move horizontally along said track.

14. An apparatus according to claim 10 wherein each arm assembly also includes a vertically extending gripper arm with a lower section on which said two gripping devices are mounted, and each lead arm is rigidly connected to a respective one of the gripper arms by a horizontally extending arm section.

15. An apparatus for moving frameworks, such as window frames or sashes, from a first work station to a second work station for further processing of the frameworks, said apparatus comprising:

- a track adapted for mounting so as to extend horizontally from one location adjacent said first work station to another location adjacent said second work station;

- an arm assembly mounted for movement along said track and adapted to move first and second separate frameworks simultaneously from said first work station to said second work station;

- first and second pairs of horizontally extending guide rails adapted for mounting so as to extend substantially from said first work station to said second work station, said first pair being located above said second pair, the distance between the guide rails of each pair corresponding substantially to an external dimension of each framework; and

- a power actuator arrangement for moving said arm assembly along said track as required for the movement of said separate frameworks from said first work station to said second work station.

16. An apparatus according to claim 15 wherein said arm assembly includes an arm device for engaging and moving said first and second separate frameworks and linear actuator means for moving said arm device selectively in a vertical direction, whereby during use of said apparatus, said linear actuator means is able to lower one section of said arm device into openings formed by the first and second frameworks when these frameworks are located at said first work station and then said power actuator arrangement is able to move said arm device horizontally so that said arm device engages said frameworks and pulls each framework along a respective one of said pairs of guide rails.

17. An apparatus according to claim 15 wherein both pairs of guide rails are adjustably mounted so that an effective horizontal distance between the guide rails of each pair can be changed and can be selected to correspond closely to said external dimension of the particular frameworks being moved.

18. An apparatus according to claim 15 wherein said power actuator arrangement includes an elongate toothed rack extending along said track and connected thereto, a rotatable gear operatively engaging said rack, and a drive motor for rotating said gear in order to cause said arm assembly to move horizontally along said track, said drive motor being mounted on said track for horizontal movement with said arm assembly.

19. An apparatus according to claim 18 wherein said arm assembly includes two gripping devices arranged one above the other and each adapted to releasably grip a respective one of said frameworks during use of said apparatus, said gripping devices being usable to grip and hold said frameworks rigidly during one or more machining operations at said second work station.

20. An apparatus according to claim 16 wherein said linear actuator means includes at least one vertically extending pneumatic cylinder and an actuator

rod slidable vertically in said cylinder, an end of said rod being connected to said one section of the arm assembly.

21. A method of manufacturing plastic frameworks, such as window frames or sashes, said method comprising:

mounting plastic sections for making two frameworks at a distance one above the other in double welding heads of a horizontal four-head welding machine;

clamping the sections in said double welding heads and welding the sections together in the double welding heads to form two welded frameworks;

allowing at least partial cooling of the frameworks so that the plastic sections of each framework are firmly connected together and releasing the welded frameworks from the double welding heads so that they can be moved horizontally therefrom;

pulling the two welded frameworks horizontally from said welding machine along respective first and second pairs of horizontally extending guide rails using an arm arrangement movably mounted on at least one horizontally extending track, and to a work station for further manufacturing steps on said frameworks, said first pair being located above said second pair; and

completing said further manufacturing steps on said frameworks.

22. A method according to claim 21 wherein said arm arrangement comprises two separate arm assemblies, each of which is movably mounted on its own horizontally extending track.

23. A method according to claim 22 including the step of inserting a portion of each arm assembly in horizontal openings formed by the two welded frameworks and engaging said portion of each arm assembly with an inner sidewall of each framework prior to pulling said two frameworks from said welding machine.

24. A method according to claim 23 wherein each arm assembly includes two gripping devices arranged one above the other, each gripping device being used to releasably engage and grip a respective one of said frameworks during said further manufacturing steps.

25. A method according to claim 23 wherein each arm assembly is movable along its respective track by means of an actuator arrangement that includes an elongate toothed rack extending along the respective track, a rotatable gear operatively engaging said rack, and a drive motor for rotating said gear, said drive motor being movably mounted on its respective track.